16 VEHICLE TRAVELLERS

16.1 INTRODUCTION

This chapter assesses the impact of the scheme on vehicle travellers which is defined in DMRB (Volume 11: Part 9 Vehicle Travellers) as view from the road and driver stress. DMRB describes the assessment of vehicle traveller impacts as those not included in the cost-benefit quantifiable economic effects.

A new road may allow people to see landscapes not easily visible at present and this can be positive or negative depending on the character of an area. The appraisal considers the extent to which travellers, including drivers, are exposed to different types and quality of landscape from the new road. Views from the road may also benefit drivers and help reduce stress but these benefits must be balanced with the need to integrate the new road in its landscape and to reduce its visual intrusion.

16.2 SOURCES OF INFORMATION

The appraisals have been informed by the following sources of information:

- site visits by the project team in 2007-2008;
- the 1:25 000 Ordnance Survey (OS) map, Loch Lomond North (Explorer 364);
- the iterative design process for the preferred scheme;
- traffic data and other road network information provided by the project team (see Chapter 4); and
- the landscape and visual appraisals of the scheme (see Chapter 10).

16.3 CONSULTATIONS

No specific feedback was provided by consultees on issues relating to view from the road.

16.4 BASELINE

16.4.1 View from the Road

There are good views of the mountain and forest landscape surrounding Crianlarich from the A82 and A85 approaching the village. The landscape of the area is described in Section 10.4.3) Once traffic has entered the village views are constrained by railway embankments and housing.

16.4.2 Driver Stress

Driver stress is defined in DMRB as the ‘adverse mental and physiological effects experienced by a driver traversing the network’. Road layouts, junction frequency, flow per lane and speeds will all affect a driver.

Stress may manifest itself in a variety of ways according to the individual, but is likely to induce feelings of discomfort, annoyance or fear culminating in physical and emotional tension that detract from both road safety and enjoyment of the journey experienced by the driver and passengers. Driver stress has three principal components as follows, of which one or more may manifest itself at any one time.

- One component of driver stress is that related to **uncertainty** about the route being followed. Route uncertainty is caused primarily by signing that is inadequate for the individual’s purposes. Junction frequency, road layout and

effectives of signing also affect the driver's ability to successfully find their route.

- A second is **frustration** and this is largely dependent on speed and flow per lane. Driver stress is caused by a driver's inability to drive at a speed consistent with his/her wishes given their perception of the general standard of the road[205]. Frustration increases as speed falls in relation to expectations and may be due to high flow levels, junctions and roadworks or to difficulties in overtaking slower moving traffic.
- The **fear** of potential accidents on a journey is the third component of driver stress. Fear is influenced by the presence of other vehicles, inadequate sight distances and the likelihood of pedestrians stepping onto the road. Other factors include inadequate lighting, narrow roads, roadworks and poorly maintained road surfaces. Fear is highest when speeds, flows and the proportion of HGVs are all high and adverse weather conditions exacerbate these factors. Road safety fears are reduced by setting high design standards[206].

Anecdotal evidence suggests that driver stress whilst travelling through the village can be high due to the number of HGVs, lack of crossing points for pedestrians, the number of informal car parks and the constricted overbridges. Traffic calming measures were constructed in 1997/1998 including relocation of the speed limit signs, extending the existing street lighting, changes to the road surface and planting and fencing works however conditions which are stressful to drivers remain due to the congestion and difficult bridges.

16.5 ASSESSMENT METHODOLOGY

The approach taken for assessing the impact of the scheme on vehicle travellers follows the guidance detailed in DMRB, Volume 11 Environmental Assessment, Part 9: Vehicle Travellers.

16.5.1 View from the Road

16.5.1.1 Methods of Prediction

The assessment has considered the quality of the view afforded for travellers from which is determined by:

- the degree of view afforded from the road;
- the quality of the view.

The degree of view has been appraised qualitatively by review of the scheme proposals and considering the road profile (whether it is in cutting, at grade or on embankment), the neighbouring topography and the presence of barriers including noise barriers, trees and buildings etc. These features may in their turn contribute to the quality or otherwise of the view from the road.

16.5.1.2 Evaluation Criteria

DMRB identifies four levels of *degree of view*:

- **No view**: road in deep cutting or contained by earth bunds, environmental barriers or adjacent structures.

[205] Prevailing conditions will include the amount of traffic on the road, weather and daylight conditions. Additionally, each road has a design speed which is determined by factors such as visibility, curvature, width, surface conditions, the presence of junctions and accesses and speed limits

[206] Design standards cover geometric aspects of road design such as curvature, gradient and sight distances as well as distance between junctions and provision for pedestrians

- **Restricted view**: frequent cuttings or structures blocking the view.
- **Intermittent view**: road generally at ground level but with shallow cuttings or barriers at intervals.
- **Open view**: view extending over many miles, or only restricted by existing landscape features.

The *quality of the view* would be determined by the quality of the landscape or the built environment through which the new road passes. It may benefit the view if attractive or distinctive features can be clearly seen or the reverse if unsightly areas are visible. Scheme landscaping can contribute to short views and mitigate the loss of view when a road is, for example, in cutting. The appraisal of quality of landscape has been informed by the landscape appraisal reported in Chapter 10.

A three-point scale of assessment of the view from the road for the proposed links (good, moderate, poor) has been used for the appraisal[207] for each route section as follows:

- **Good:** vehicle travellers' views are persistent (unobstructed) and extensive, providing a positive experience for travellers;
- **Moderate**: views are intermittent but generally enhance the travellers experience; and
- **Poor:** views are often obstructed and/or of poor quality, detracting from the travellers' experience.

16.5.2 Driver Stress

DMRB advocates the use of a three-point descriptive scale for representing driver stress which is based upon traffic speeds and flows in moving traffic[208]. The scale does not specifically address stress caused by queues.

16.5.2.1 Methods of Prediction

An appraisal has been undertaken of the effects on drivers of travelling on the new A82 (T) as compared with current conditions on the A82 in the year of opening (2011) and 15 years after opening (2026). The criteria set out in Section 16.5.2.2 have been used to assess the significance of effects.

16.5.2.2 Evaluation Criteria

Table 16.1 below outlines the conditions under which low, moderate and high stress levels are encountered for single carriageway roads as set out in DMRB.

Table 16.1: Evaluation of Driver Stress

SINGLE-CARRIAGEWAY ROADS			
Average Peak Hourly Flow per Lane, in flow units/1 hour	**Average Journey Speed km/hr (mph)**		
	Under 50 (31)	**50 – 70 (31-44)**	**Over 70 (Over 44)**
Under 600	**High/Moderate***	**Moderate**	**Low**
600 – 800	**High**	**Moderate**	**Moderate**
Over 800	**High**	**High**	**High**

Source: Design Manual for Roads and Bridges, Volume 11 Part 9
* = Moderate in urban areas

[207] It was considered that the scale of effects (minor, moderate, major) described in Section 1.6 and used for other appraisals in the ES was not suitable for this chapter and has thus been adapted to help better understand the effects for travellers

[208] Traffic flows are measured in flow units where a car of light van equals one flow unit and HGVs or public service vehicles equal 3 flow units

The extent of stress induced in individual drivers will differ due to variations in their skills, experience, temperament, knowledge of the route and state of health. DMRB notes that, in principle, driver stress can be a factor in decisions on the traffic capacity to be provided for new schemes, though traffic capacity aspects will usually be the subject of more detailed engineering and traffic design investigations. The guidance suggests that for new or improved routes, designed in accordance with current standards, the appropriate category would normally be 'moderate' or 'low'.

16.6 POTENTIAL IMPACTS

16.6.1 View from the Road

The permanent effects resulting from elements of the design of the scheme (see Section 16.7) would affect the operational effects for travellers. These can be summarised as:

- quality of scheme design including planting;
- opportunities taken in the scheme design to benefit the road user in views from the road; and
- obstruction of views by earth bunds, environmental barriers, adjacent structures and/or scheme planting.

16.6.2 Driver Stress

Permanent

- None perceived.

Construction

- Increased frustration for drivers resulting from delays caused by traffic management measures used to facilitate construction; and
- confusion for drivers caused by road works (narrow lanes; signs etc).

Operational

The potential stress impacts for drivers are described in Section 16.5.2. These can be summarised as:

- uncertainty;
- frustration; and
- fear.

The degree of impact on the A82(T) and the existing road would result from:

- the ease of the journey between through Crianlarich;
- the reduction in frustration caused by queuing at the Glenfalloch Road/Callander Road junction and at the two restrictive railway bridges within Crianlarich; and
- driver stress resulting from accidents or maintenance activities in the future.

16.7 MITIGATION

View from the Road

Mitigation in terms of capturing benefits for travellers using the road and the views they experience and reducing negative effects is built in to the scheme design (see below) and the additional landscape and visual mitigation described in Section 10.7. The degree to which travellers benefit is always a balance between seeking

to achieve pleasant views for the road user with the need to achieve other effective mitigation, and priority has been given in this design to mitigation for the existing receptors (see also Annex C).

Road Design
The vertical alignment of the road (i.e. the extent to which cuttings and embankments are used) affects the extent to which travellers can see the landscape (and townscape) through which they are passing. This has been influenced by environmental considerations such as seeking to balance cut and fill, fitting the new road alignment into the surrounding topography, the need for noise barriers and planting and landscaping proposals to screen the road from nearby properties. The view from the A82(T) experienced by travellers would also be affected by physical roadside obstructions such as safety barriers, signs, lighting and acoustic barriers (bunding and fencing).

Environmental barriers, particularly those needed to reduce traffic noise would be required in some locations along the scheme, and these would have potential to partially screen the view from the road anywhere with a barrier 1.5m high would restrict views from the road, 1.8m high would normally obstruct them). Further information on noise impacts and their mitigation is presented in Chapter 13 Noise and Vibration.

Landscape proposals have been developed to ensure that the road links with existing areas of landscape importance and vegetation, and to ensure that attractive vegetation typical of the local area is provided throughout the scheme. Further information on scheme landscape is provided in Chapter 10 and an outline landscape design for the scheme is shown on Figures 10.9a-c.

Driver Stress
Mitigation to reduce driver stress is embedded in the scheme design. The scheme design has taken account of traffic flows in the year of opening and 15 years after opening.

16.8 ASSESSMENT OF RESIDUAL EFFECTS

16.8.1 View from the Road

This section reports the effects of the scheme on travellers' views from the road taking account of the scheme design and committed mitigation measures. The predicted impacts on vehicle travellers in terms of the view from the road afforded by the scheme have been assessed for each component of the scheme and in terms of the overall scheme. In addition, consideration has been given to impacts on the view from the existing road network as a result of construction and operation of the scheme. Visual effects from scheme construction activities are set out in Section 11.8.

Impacts to vehicle travellers' view from the road have been assessed by route section, and the assessment is presented in Table 17.3. Effects have been considered in relation to the quality of the landscape through which the route passes and the extent to which this landscape would be visible from the road as determined by its physical characteristics including the extent to which cuttings and other barriers (e.g. noise fences) hinder the view from the road.

Table 17.3: Assessment of Impacts on View from the Road

Route Section	Key Views	Assessment of View from the A82(T)	Assessment of View from the Existing A82 with New Road in Place
Southern roundabout to Crianlarich Station	The southern roundabout is in slight cut, then the road is on slight embankment , except for a short cut, through the rocky spur that currently carries the West Highland Way spur. However, a landscape bund on the east side of the road would create the impression of a one-sided cut and restrict views to the east, except where the road crosses the realigned spur of the West Highland Way. There would be a glimpse of the south end of the village from the roundabout and short views of pleasant landscape to the edge of the forest west of the road	The views would be of roadside embankment to the east and short views of moorland and the edge of the plantation to the west. In the scale of this assessment they are **poor** in terms of obstruction but **moderate** in terms of the quality of what is viewed	There would be no significant change to the view from the existing road. Along a short section of Glenfalloch Road, the views to the west would be slightly shorter than they are currently because of the landscape bund. However, the main views in this section, north and southeast to the surrounding hills would be unaffected
Adjacent to Crianlarich Station	Immediately north of the rock cutting , the road is on embankment for about 80m. This section of road is deliberately kept clear of bunding and planting to afford a view out to the east across falling ground to the village. The view to the west would remain constrained by rising ground	This short section (4 to 5 seconds depending on driver speed will provide **good** views, a glimpse of Crianlarich station and the hills beyond for southbound drivers and a glimpse across the village and up Glen Dochart for northbound drivers	The new road would be obliquely visible from the existing road but there would be no material change in the quality of the views from this road
Crianlarich Station to the northern roundabout	This section of road cuts deeply into side-long ground with a large cut slope on the west side and a mixture of small cut and large embankment on the east side. However a significant bund for landscape and noise reasons would close views to the east, leaving drivers with the impression of being in a deep cutting	The views from this section of road would be **poor**	The new road would not be visible from the existing road, except at the roundabout, and would have no material effect on the views from this road
New A82 Southern section	Intermittent View	Road generally at ground level but with shallow cuttings/fill	Little impact of new route
New A82 Northern section	No view	Road in some deep cut	No impact of new route

16.8.2 Driver Stress

The driver stress assessment of operational conditions has been carried out using the evaluation criteria in Table 16.1. The findings of the assessment for the existing A82 are presented in Table 16.3 and the results from the new A82 (T) assessment in Table 16.4.

Table 16.3: Assessment of Existing A82 on Driver Stress

DIRECTION / SUB-LINK	YEAR	AM PEAK		PM PEAK	
		Flow Units per Hour	DMRB Rating	Flow Units per Hour	DMRB Rating
Northbound					
A82 south of village	2011	295	Moderate	240	Moderate
	2026	350	Moderate	290	Moderate
A82 west of village	2011	445	Moderate	360	Moderate
	2026	530	Moderate	430	Moderate
Southbound					
A82 south of village	2011	275	Moderate	315	Moderate
	2026	330	Moderate	375	Moderate
A82 west of village	2011	485	Moderate	575	Moderate
	2026	580	Moderate	690	High

Table 16.4: Assessment of Proposed A82 (T) Scheme on Driver Stress

DIRECTION / SUB-LINK	YEAR	AM PEAK		PM PEAK	
		Flow Units per Hour	DMRB Rating	Flow Units per Hour	DMRB Rating
Proposed A82(T) – Northbound					
New A82	2011	235	Low	195	Low
	2026	280	Low	230	Low
Proposed A82(T) – Southbound					
New A82	2011	220	Low	250	Low
	2026	265	Low	300	Low
Existing A82 route – Northbound					
A82 south of Village	2011	60	Moderate	50	Moderate
	2026	70	Moderate	60	Moderate
A82 west of village	2011	90	Moderate	70	Moderate
	2026	110	Moderate	90	Moderate
Existing A82 route – Southbound					
A82 south of Village	2011	55	Moderate	65	Moderate
	2026	65	Moderate	75	Moderate
A82 west of village	2011	100	Moderate	115	Moderate
	2026	115	Moderate	140	Moderate

As shown in Table 16.3, current stress on the A82 is assessed as moderate, Table 16.4 illustrates that with the scheme in place, driver stress would reduce to low for the majority of users.

16.8.2.1 Permanent

No permanent driver stress effects would result from the scheme.

16.8.2.2 Construction

Construction is estimated to last some 12 months (see Section 3.3.3). During this time the movement of construction vehicles and in particular HGVs could result in locally elevated traffic flows on routes used by construction traffic to access the working areas of the site. It has been assumed that there would be 60 HGV movements per day (see Section 12.9). A worst case scenario would be that all these movements passed through the village centre. The existing HGV

movements at the A82/A85 junction are approximately 330 HGV per day (annual average) (see Section 4.3). It is however likely that HGVs would be routing to a variety of destinations. The roads which could be affected are:

- the existing A82 (south of Crianlarich);
- the existing A82 (north of Crianlarich); and
- the Callander Road (A85); and
- the Tyndrum Road.

It is assumed that temporary shuttle working would be used on site for two weeks at each of the tie in locations (see Section 3.3). This could result in some increase in driver stress over this period.

Impacts would be controlled by ensuring construction traffic uses the routes identified in the contract and adequate warning was provided to road users (through the media and using signage) and this would help reduce driver stress by being aware of issues in good time which would enable alternative planning of journeys if required.

16.8.2.3 Operational

Driver stress on the new route is assessed as low with the existing route remaining moderate through the village because traffic on the road would still be passing through a built up area although there would be benefits for local traffic because traffic flows on the existing route would be significantly reduced.

16.9 SUMMARY

The effects of the scheme on vehicle travellers can be summarised as follows:

16.9.1 View from the Road

- The view from the existing road is of the village, and provides an interesting variation in the experience of a mainly rural route. The views from the new road would be very restricted, mainly of cutting (and false cutting) slopes (required to give noise protection to nearby properties) with planting. The new road would remove contrast from the visual experience of those using the A82 and replace it with mainly poor quality views. Overall this would be a moderately adverse effect on the road users' visual experience.

16.9.2 Driver Stress

- Driver stress on the existing A82 is assessed as moderate.
- Driver stress on the new route is assessed as low with the existing route remaining moderate through the village because traffic on the road would still be passing through a built up area. The traffic flows on the existing route would be significantly reduced.